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मुख्य सम्पादक – डॉ. कृष्णबीर सिंह का मानद पद एवं कार्य पूर्णतः अवैतनिक है।
इस शोध पत्रिका के प्रकाशन, सम्पादन एवं मुद्रण में पूर्णतः सावधानी बरती गई है। किसी भी प्रकार की त्रुटि महज मानवीय भूल मानी जाये। शोध पत्र की समस्त जिम्मेदारी शोधपत्र लेखक की होगी। त्रुटी हेतु सम्पादक, प्रकाशक एवं मुद्रक जिम्मेदार नहीं होगा।
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Research Paper - Foods and Nutrition

Effect of Pesticide 'Companion' on the Nutritional Composition and Certain Metabolically Important Enzymes of Whole Green Gram at the Early Stages or Germination

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A B S T R A C T

Investigations were carried out to see the effect of pesticide 'companion' on the proximal composition and enzyme namely amylase, GOT and GPT of whole green gram in the early stages of germination. The findings revealed that the pesticides increase the enzyme activity in the early stages of germination and thus increase the metabolic rate. The Vitamin-C content was also enhanced with the use of pesticide, but there was a decrease in the proximal composition of the gram when treated with pesticide.

Key words :

Pesticide,companion, germination,enzyme, nutritional composition, metabolic activity.

Nowadays, there is a drastic increase in the use of pesticides in the agricultural farms to keep away pests and other micro-organisms which destroy the plant and thereby decrease the yield of crop. A report by the ICMR shows that 51% of food is contaminated with pesticides, out of which 20% have levels of pesticides, exceeding the maximum tolerance limits. These pesticides post a threat to the human health. Apart from other dreadful side effects, pesticides also attack our immune system, cause cancers, hormonal disruptions and other degenerative diseases and are counted as a cause for increasing instances of infertility (Caffarelli et. al. 1999).

Besides, chemicals which are released into the environment may have a variety of dreadful ecological effects. These effects can be global or local, temporary or permanent. The most serious effects involve loss in production, changes in

nutrient cycling and losses of valuables species (Guallar et.al. 1999). These ecological losses, in turn, prove economical, aesthetical and socially important (Monga 2001).

The pesticides have an effect on nutritional composition of food as well as their metabolic rate and even enzyme activity of foods. The present study, therefore, was undertaken to see the effect of pesticides on the nutritional composition and on some metabolically active enzymes of pulses at early stages of germination.

The green gram whole was distributed into two groups – one was treated with pesticide and other was the control. The proximal composition of both the samples was investigated which included moisture, ash, fat, fiber, crude protein, available carbohydrates, and vitamin C.

The enzymes related to nitrogen metabolism namely GOT, GPT and amylase of carbohydrate metabolism were also studied.

Materials and Methods

Green gram whole (phaseolus aureus roxb) was purchased from the local market of Jaipur.

Pesticide : 'Companion' pesticide was used for the study because it is commonly used for cereals and pulses. The chemical composition of the 'companion' is as follows :

Carbendazim Technical (98% Pure)	12.25% W/W
Mancozeb (85% Pure)	74.12 W/W
Sodium Salt of Alkyl Aryl Sulfonate	2.00% W/W
Sodium Salt of Alkyl Naphthyl Sulfonate	2.00% W/W
Kaslin (inert filter)	9.63% W/W
Total	**100.00% W/W**

Method

Two groups of sample of green gram whole were taken. One group of sample was not treated with pesticide and was named as the CONTROL GROUP.

The other group which was treated with pesticide 'companion' was named as the EXPERIMENTAL GROUP. Nutrient content of both CONTROL and EXPERIMENTAL groups were estimated at the following stages :

(a) Steeping for 8 hrs.
(b) Germination for 12, 24, 36, 48 hrs.

The following parameters were taken for the study :

1. Proximal composition :

- ♦ Moisture
- ♦ Ash
- ♦ Crude Protein (Nx6.25)
- ♦ Fat
- ♦ Fibre Content
- ♦ Calculated Carbohydrate

Raghuramalu et.al. (1983)

2. Vitamin C : Raghuramalu et.al. (1983)

3. Enzymes :

- ♦ GOT : Reitman and Frankel (1957)
- ♦ GPT : Reitman and Frankel (1957)
- ♦ Amylase : Street and Close Method (1956)

Statistical Analysis

All the readings were taken twice and their mean values were recorded.

Results and Discussion

The results of the proximal composition revealed that there was a decrease in almost all nutrients in the experimental group except ash in which there was decrease in some stages while increase in the other. The **Table I** shows **(SEE TABLE-I)** that the fat content was affected by the pesticide 'companion' where it reduced 5-6% compared to the control group.

The maximum decrease was observed in 24h of germination. With advanced germination, fibre content showed a marked increase. Akpapunam and Achinewhu (1984) also reported an increase of 13.04% and 21.73% in the fibre content of cowpea in 24 and 48h of germination respectively. The pesticide 'companion', on the contrary, reduced the fibre content in different stages of germination with a maximum decrease after 36h.

Although the decrease in the fibre content of experimental sample was not so significant but it shows that alongwith other harmful effects the pesticide also has an effect on the nutritive value of food. Available carbohydrates were also affected by the pesticide and maximum reduction of 4 and 8% was observed after 36h of germination.

Germination for 24h was beneficial for vitamin C content which increased considerably but then a decline was seen on further germination. Fordham et. al. (1975) proved that vitamin C content increases upto a certain period, thereafter it declines following further germination. Experimental group, interestingly, showed maximum increase at the state of 36h of germination.

Table 2 shows **(SEE TABLE-II)** the enzyme activity following germination. The amylase activity in both control and experimental groups increased significantly. Bednakshi et. al. (1985) reported higher amylase activity due to germination of beans. The enzyme amylase is responsible for degrading starch into reducing dextrin and smaller saccharides (Nagar, 1994).

During seed germination more energy is required by the seed which is given by simple sugars (Saini, 1998). Amylase activity, therefore, plays significant role during seed germination (Doesthale, 1982).

Maximum activity was seen at 36h of germination i.e. 93.6% higher than that of the steeping stage in the control group. Whereas, Pesticide 'companion' increased the metabolic activity because in experimental group, where maximum activity was seen at 24h germination. GOT and GPT enzymes are responsible for nitrogen metabolism. Both the enzymes were found to be more active in experimental group of seeds which showed the increased rate of metabolism due to the pesticide 'companion'. This higher metabolism results in increased yield of crop.

On the basis of the results of the study, it may be concluded that the use of pesticides increase the yield of crop by increasing the metabolic rate in the initial stage of germination. This higher yield appeals the farmers since they get more profit but unfortunately with increased use of pesticides in food, the consumer is cheated. On one hand they don't get sufficient nutrients from the food and on the other they are inheriting many dreadful and fatal diseases which cause irrepairable losses to the human body.

So, the time has come to take some strict action to fight against this curse to the mankind. The most prominent way is the adoption of the ancestral techniques to grow the crops, which today is known as 'organic farming'. This way we can protect our future generations from this 'slow poison' which we have already consumed in large amounts.

Table 1 : Proximal Composition and Vitamin-C content of Two Groups

Treatment	Moisture g/100g		Ash g/100g		Fat g/100g		Crude Protein Nx6.25 g/100g		Fibre g/100g		Available Carbohydrate		Vitamin-C mg/100g	
	Control	Experimental	C	E	C	E	C	E	C	E	C	E	C	E
Steeping	45.81	46.15	3.3	3.4	1.71	1.61	24.17	24.11	4.19	4.15	20.82	20.58	7.73	8.08
Germinated for 12h	47.8	48.38	3.3	3.3	2.12	2.01	24.63	24.41	4.4	4.21	17.75	17.69	28.31	33.48
Germinated for 24h	48.35	49.19	3.2	3.1	2.35	2.21	24.91	24.66	4.61	4.36	16.58	16.48	30.3	59.01
Germinated for 36h	48.91	50.53	3.1	3.0	2.69	2.55	25.2	24.9	4.79	4.42	14.67	14.67	25.89	45.39
Germinated for 48h	50.8	51.57	3.0	3.0	3.06	2.9	25.3	25.02	4.92	4.56	12.95	12.95	16.3	23.99

Table 2 : Amylase, GPT, GOT enzyme activities of green gram whole of two groups at different stages of treatment

Treatment	Amylase Activity (Street) Close Unit/Ml. of homogenate		GPT Activity (K.A.) Units/Ml. of Homogenate		GOT Activity (K.A.) Units/Ml. of Homogenate	
	Control	Experimental	C	E	C	E
Steeping	454	556.6	31.2	38.3	20	30
Germinated for 12h	707.8	872.3	187.5	240.2	60	100
Germinated for 24h	803	993.2	305.5	393.2	80	120
Germinated for 36h	879.2	1060.2	423.7	503.2	100	130
Germinated for 48h	784	943.3	297.6	384.3	80	110

REFERENCE

1 Duhan A. (Nutritive Evaluation of Pigeon Pea) Cajanus Kajan. Varietal differences and effect of different processing methods. Chemical abstract vol. 122 (1994).

2 Bishnoi S., Kheterpaul N., Yadav R.K. (1991) Effect of domestic processing and cooking methods on phytic acid and polyphenol content of pea cultivars Pisum sativum. Plant Food Hum. Nutr. 45(4) : 381-8.

3 Bharti V.C., Rao M. (1997) Studies on under exploited grain legumes : winged bean and black bean. Proc. Nutr. Soc. Ind. XXXI Ann. Meeting, National Institute of Nutrition, Hyderabad 35.

4 Markakis S. (1996) Carob bean in food and feed : Current status and future potentials. A critical appraisal, J. Food Sci. Technol. 33 (5) 365-83.

5 Neerja R. and Charanjeet K.H. (1993) Effect of various treatments on nutritional quality of faba beans Vicia faba. J. Food Sci. Technol. 30(6) 413-16.

6 Bednakshi W Tomasik J and Plalkowsker B (1985). Processing suitability and nutritive value of field bean seeds after germination. Journal of Food Science and Agriculture, 36 : 745-754.

7 Cafferelli V Rapagnani MR Letardi A Triolo L Santaroni P Lancia B (1999) Pesticide residues in horticultural products and carcinogenic risk for consumers. Human and environmental exposure to xenobiotics. Proceedings of the II symposium Pesticide Chemistry crenona, Italy 11-15 September 1999 ISBN 88-7830-299-6: 665-669.

8 Fordham JR Wells CE Chen LH (1975) Sprouting of seeds and nutrient composition of seeds and sprouts. Journal of Food Science 40: 552-556.

9 Guallar. E Sanz Gallardo MI Veer P Van't Langnecker MP Strain JJ Martin BC Kardinaal AFM Fernandez-Crehuet J Thamm M Kohlmeier L Kok FJ and Martin Moreno JM (1999) Determinants of p, p'dichlorodiphenyldichloroethane (DDE) concentration in adipose tissues in women from five European cities. Archives of Environmental Health 544: 277-283.

10 Monga GS (2001) Environment and Development. Deep and Deep Publication Pvt. Ltd. New Delhi, 336-338.

11 Nagar R (1994) Biochemical effects of germination in seeds of legumes. A review article published in a book entitled 'VISTAS' in seed biology. Edited by Singh T and Trivedi PC Printwell Publishers, 220-225.

12 Raghuramalu N Narayan M. Kalansundaram S (1983). A Manual of Laboratory Techniques. National Institute of Nutrition ICMR Hyderabad.

13 Reitman S. and Frankel S. (1957) Amer J. Clin. Path. 28-56.

14 Saini HS (1998) Extractability and Evaluation of galactosides of sucrose in leguminous seeds. Food Chemistry 28: 149-157.

15 Street HV and Close JR (1956) Clin. Chem. Acta. 1:256.

16 Deosthale Y.G. (1982). Home Processing and Nutritive Nature of Pulses. Nutritive Value of Indian Foods NIN Hyderabad, 3:122.

17 Akpapunam MA Achinewhu SC (1985). Effect of Cooking, germination and fermentation on the Chemical Composition of Nigerian beans (Vigma ungriculata). Plant Food Humn. Nutr. 35 : 353-58.